

## SEQUENCE LISTING

<110> Sim, Gek-Kee  
Yang, Shumin  
Sellins, Karen S.

<120> NOVEL FORMS OF T CELL COSTIMULATORY PROTEINS, NUCLEIC  
ACID MOLECULES, AND USES THEREOF

<130> IM-1-C1-PCT

<140> not yet assigned

<141> 1999-03-19

<150> 60/078,765

<151> 1998-03-19

<150> 09/062,597

<151> 1998-04-17

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&lt;211&gt; 329

&lt;212&gt; PRT

&lt;213&gt; Canis familiaris

&lt;400&gt; 7

Met Tyr Leu Arg Cys Thr Met Glu Leu Asn Asn Ile Leu Phe Val Met  
 1 5 10 15

Thr Leu Leu Leu Tyr Gly Ala Ala Ser Met Lys Ser Gln Ala Tyr Phe  
 20 25 30

Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn Ile  
 35 40 45

Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu Val  
 50 55 60

Leu Tyr Glu Leu Tyr Arg Gly Lys Glu Asn Pro Gln Asn Val His Arg  
 65 70 75 80

Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu Arg  
 85 90 95

Leu His Asn Ile Gln Ile Lys Asp Lys Gly Leu Tyr Gln Cys Phe Val  
 100 105 110

His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Asn Ser  
 115 120 125  
 Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met Val Thr  
 130 135 140  
 Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser Ser  
 145 150 155 160  
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val Lys Thr  
 165 170 175  
 Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn  
 180 185 190  
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe Ser Val  
 195 200 205  
 Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu Glu Ser  
 210 215 220  
 Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Asp Ala His Thr Lys Pro  
 225 230 235 240  
 Thr Pro Asp Gly Asp His Ile Leu Trp Ile Ala Ala Leu Leu Val Met  
 245 250 255  
 Leu Val Ile Leu Cys Gly Met Val Phe Phe Leu Thr Leu Arg Lys Arg  
 260 265 270  
 Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Asn Lys Val  
 275 280 285  
 Glu Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His Glu  
 290 295 300  
 Thr Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr Ala  
 305 310 315 320  
 Ser Gly Asp Asn Ser Thr Thr Gln Phe  
 325

&lt;210&gt; 8

&lt;211&gt; 1897

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;400&gt; 8

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 agttggctct tgaacagttg ccctgagcca tcctctcagc catttttttc aagaagagaa 120  
 gtaggggttca cagtgcatag tgctttcctg cttcaciaaag agtcacctgc taaggcttat 180  
 ccatagcttg ttaggcaggt ggatcttctt cagattagca gcagcccaga tagaagtggc 240  
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 ccaccagac tgcagaggta gtcacaaata tacaagatgg aatgaggcac tatcttagaa 540  
 ttaagcatag ataaaagcca ttagtccagt aattgggagt tctacataaa acacaatgta 600  
 taaaattaag aaaagaaggc tgaatctgaa acaggagggtg ttagtcttaa acattattcc 660  
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 aaaaggcaag ccaaatttg aaaggaagg catataaaca atggatggac ttactctttt 900  
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gataggtcag aattcatctg gtgcatggga acgagtcctt tgggcccttt atgatgaacg 1560  
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<210> 9

<211> 987

<212> DNA

<213> Canis familiaris

<400> 9

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tatgggtgctg cttccatgaa gagtcaagca tatttcaaca agactggaga actgccatgc 120  
cattttacaa attctcaaaa cataagcctg gatgagttgg tagtgttttg gcaggaccag 180  
gataagctgg ttctgtacga gctatacaga ggcaaagaga accctcaaaa tgttcatcgc 240  
aagtataagg gccgcacaag ctttgacaaa gacaattgga cctgagact ccataatatt 300  
cagatcaagg acaagggctt gtatcaatgt ttcgttcac ataaagggcc caaaggactc 360  
gttcccatgc accagatgaa ttctgacctt tcagtgtttg ctaacttcag tcaacctgaa 420  
ataatggtaa cttctaataag aacagaaaaat tctggcatca taaatttgac ctgctcatcc 480  
atacaagggt acccagaacc caaggagatg tatttttttg taaaaaccga gaattcaagt 540  
actaagtatg atactgtcat gaagaaatct caaaataatg tcacagaact ctacaacgtt 600  
tctatcagct tgtccttctc agtccttgaa gcaagcaatg tgagcatctt ctgtgtcctg 660  
caacttgagt caatgaagct tccctcccta ccttataata tagatgcaca tacgaaaccc 720

acccctgatg gagaccacat cctctggatt gcggctctgc ttgtaatgtt ggtcattttg 780  
 tgtgggatgg tgttctttct aacactaagg aaaaggaaga agaagcagcc tggcccctct 840  
 catgaatgtg aaaccaacaa agtggagaga aaagaaagtg agcagaccaa ggaaagagta 900  
 cggtagcatg aaacggaaag atctgatgaa gccagtggtg ttaacatttc gaagacagct 960  
 tcaggcgaca acagtactac acagttt 987

<210> 10

<211> 987

<212> DNA

<213> *Canis familiaris*

<400> 10

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 atcagatctt tccgtttcat ggtaccgtac tctttccttg gtctgtcac tttcttttct 120  
 ctccactttg ttggtttcac attcatgaga ggggccaggc tgcttcttct tctttttcct 180  
 tagtgtaga aagaacacca tccacacaa atgaccaac attacaagca gagccgcaat 240  
 ccagaggatg tggctctccat caggggtggg ttctgtatgt gcacttatat tataaggtag 300  
 ggagggaagc ttcattgact caagttgcag gacacagaag atgtcacat tgcttgcttc 360  
 agggactgag aaggacaagc tgatagaaac gttgtagagt tctgtgacat tattttgaga 420  
 tttcttcatt acagtatcat acttagtact tgaattctcg gtttttacca aaaaatacat 480  
 ctcttggtg tctgggtaac ctgtatgga tgagcaggtc aaatttatga tgccagaatt 540  
 ttctgttcta ttagaagtta ccattatttc aggttgactg aagttagcaa gcactgatag 600  
 gtcagaattc atctggtgca tgggaacgag tcttttgggc cttttatgat gaacgaaaca 660  
 ttgatacaag cccttgctct tgatctgaat attatggagt ctgagggtcc aattgtcttt 720  
 gtcaaagctt gtgcggccct tatacttgcg atgaacattt tgagggttct ctttgccctct 780  
 gtatagctcg tacagaacca gcttatcctg gtctgcca aacactacca actcatccag 840  
 gcttatgttt tgagaatttg taaaatggca tggcagttct ccagtcttgt tgaaatatgc 900  
 ttgactcttc atggaagcag caccatagag caggagggtc atcacaaga gaatgttatt 960



cagttccata gtgcatctga gatacat

987

&lt;210&gt; 11

&lt;211&gt; 1024

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (79)..(783)

&lt;400&gt; 11

ctttgacggtt ttgttttgtt ttgttctaac acaagaaaaa aaaaaaagag gagttatcct 60

tcagcagcag cagaagcc atg gat tac aca gcg aag tgg aga aca cca cca 111

Met Asp Tyr Thr Ala Lys Trp Arg Thr Pro Pro

1

5

10

ctc aaa cac cca tat ctc aag gtc tct cag ctc ttg gtg cta gct agt 159

Leu Lys His Pro Tyr Leu Lys Val Ser Gln Leu Leu Val Leu Ala Ser

15

20

25

ctc ttt tac ttc tgt tca ggc atc atc cag gtg aac aag aca gtg aaa 207

Leu Phe Tyr Phe Cys Ser Gly Ile Ile Gln Val Asn Lys Thr Val Lys

30

35

40

gaa gta gca gta ctg tcc tgt gat tac aac att tcc act aca gaa ctg 255

Glu Val Ala Val Leu Ser Cys Asp Tyr Asn Ile Ser Thr Thr Glu Leu

45

50

55

atg aaa gtt cga atc tat tgg caa aag gat gat gaa gtg gtg ctg gct 303

Met Lys Val Arg Ile Tyr Trp Gln Lys Asp Asp Glu Val Val Leu Ala

60

65

70

75

gtc aca tct gga caa acg aaa gtg tgg tcc aag tat gag aat cgc acc 351

Val Thr Ser Gly Gln Thr Lys Val Trp Ser Lys Tyr Glu Asn Arg Thr

80

85

90

ttt gct gac ttc acc aat aac ctc tcc atc gtg att atg gct ctg cgc 399

Phe Ala Asp Phe Thr Asn Asn Leu Ser Ile Val Ile Met Ala Leu Arg

95

100

105

ctg tca gac aat ggc aaa tac acc tgt atc gtt caa aag act gaa aaa 447

Leu Ser Asp Asn Gly Lys Tyr Thr Cys Ile Val Gln Lys Thr Glu Lys

110

115

120

agg tct tac aaa gtg aaa cac atg act tcg gtg atg tta ttg gtc aga 495  
 Arg Ser Tyr Lys Val Lys His Met Thr Ser Val Met Leu Leu Val Arg  
 125 130 135

gct gac ttc cct gtc cct agt ata act gac ctt gga aat cca tcc cat 543  
 Ala Asp Phe Pro Val Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His  
 140 145 150 155

gac atc aaa agg ata atg tgt tca acc tct gga ggt ttt cca aag cct 591  
 Asp Ile Lys Arg Ile Met Cys Ser Thr Ser Gly Gly Phe Pro Lys Pro  
 160 165 170

cac ctc tcc tgg tgg gaa aat gaa gaa gaa ttg aat gct gcc aac aca 639  
 His Leu Ser Trp Trp Glu Asn Glu Glu Glu Leu Asn Ala Ala Asn Thr  
 175 180 185

aca gtt tcc caa gac ccg gac act gag ttg tac act att agt agt gaa 687  
 Thr Val Ser Gln Asp Pro Asp Thr Glu Leu Tyr Thr Ile Ser Ser Glu  
 190 195 200

ctg gat ttc aat ata aca agc aac cat agc ttt gtg tgt ctt gtc aag 735  
 Leu Asp Phe Asn Ile Thr Ser Asn His Ser Phe Val Cys Leu Val Lys  
 205 210 215

tat gga gac tta aca gta tca cag atc ttc aac tgg caa aaa tgt aag 783  
 Tyr Gly Asp Leu Thr Val Ser Gln Ile Phe Asn Trp Gln Lys Cys Lys  
 220 225 230 235

taacattggt ctgaggagtt tctactgtgt aaaatctaaa aagaaaataa ctcagccaga 843

tacatttttg aattatgtat gttaactttg atagcatttc ttgtattttt agaccataa 903

atgataatga agtgatattg tgacttggtta aggtcactgt acaggtatgg ccataatggt 963

actaatttta tttcctttaa taaaccttct aaaactgaga catccaaaaa aaaaaaaaaa 1023

a 1024

<210> 12

<211> 235

<212> PRT

<213> Canis familiaris

<400> 12

Met Asp Tyr Thr Ala Lys Trp Arg Thr Pro Pro Leu Lys His Pro Tyr  
 1 5 10 15

Leu Lys Val Ser Gln Leu Leu Val Leu Ala Ser Leu Phe Tyr Phe Cys  
                   20                                  25                                  30  
 Ser Gly Ile Ile Gln Val Asn Lys Thr Val Lys Glu Val Ala Val Leu  
                   35                                  40                                  45  
 Ser Cys Asp Tyr Asn Ile Ser Thr Thr Glu Leu Met Lys Val Arg Ile  
                   50                                  55                                  60  
 Tyr Trp Gln Lys Asp Asp Glu Val Val Leu Ala Val Thr Ser Gly Gln  
                   65                                  70                                  75                                  80  
 Thr Lys Val Trp Ser Lys Tyr Glu Asn Arg Thr Phe Ala Asp Phe Thr  
                                   85                                  90                                  95  
 Asn Asn Leu Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly  
                   100                                  105                                  110  
 Lys Tyr Thr Cys Ile Val Gln Lys Thr Glu Lys Arg Ser Tyr Lys Val  
                   115                                  120                                  125  
 Lys His Met Thr Ser Val Met Leu Leu Val Arg Ala Asp Phe Pro Val  
                   130                                  135                                  140  
 Pro Ser Ile Thr Asp Leu Gly Asn Pro Ser His Asp Ile Lys Arg Ile  
                   145                                  150                                  155                                  160  
 Met Cys Ser Thr Ser Gly Gly Phe Pro Lys Pro His Leu Ser Trp Trp  
                   165                                  170                                  175  
 Glu Asn Glu Glu Glu Leu Asn Ala Ala Asn Thr Thr Val Ser Gln Asp  
                   180                                  185                                  190  
 Pro Asp Thr Glu Leu Tyr Thr Ile Ser Ser Glu Leu Asp Phe Asn Ile  
                   195                                  200                                  205  
 Thr Ser Asn His Ser Phe Val Cys Leu Val Lys Tyr Gly Asp Leu Thr  
                   210                                  215                                  220  
 Val Ser Gln Ile Phe Asn Trp Gln Lys Cys Lys  
                   225                                  230                                  235

&lt;210&gt; 13

&lt;211&gt; 1024

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;400&gt; 13

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 tttatgggtc taaaaatata agaaatgcta tcaaagttaa catacataat tccaaaatgt 180  
 atctggctga gttattttct ttttagattt tacacagtag aaactcctca gaacaatgtt 240  
 acttacattt ttgccagttg aagatctgtg atactgttaa gtctccatac ttgacaagac 300  
 acacaaagct atggttgctt gttatattga aatccagttc actactaata gtgtacaact 360  
 cagtgtccgg gtcttgggaa actgttgtgt tggcagcatt caattcttct tcattttccc 420  
 accaggagag gtgaggcttt ggaaaacctc cagagggtga acacattatc cttttgatgt 480  
 catgggatgg atttccaagg tcagttatac tagggacagg gaagtcagct ctgaccaata 540  
 acatcaccga agtcatgtgt ttcactttgt aagacctttt ttcagtcttt tgaacgatac 600  
 aggtgtatth gccattgtct gacaggcgca gagccataat cacgatggag aggttattgg 660  
 tgaagtcagc aaagggtcga ttctcatact tggaccacac ttctgtttgt ccagatgtga 720  
 cagccagcac cacttcatca tccttttgcc aatagattcg aactttcatc agttctgtag 780  
 tggaaatgth gtaatcacag gacagtactg ctacttcttt cactgtcttg ttcacctgga 840  
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 atgggtgtht gagtgggtgt gttctccact tcgtgtgtga atccatggct tctgtgtgtg 960  
 ctgaaggata actcctcttt ttttttttct ttgtgttaga acaaaacaaa acaaaacgtc 1020  
 aaag 1024

&lt;210&gt; 14

&lt;211&gt; 705

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;400&gt; 14

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acagtgaag aagtagcagt actgtcctgt gattacaaca tttccactac agaactgatg 180  
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gacttccttg tccctagtat aactgacctt ggaaatccat cccatgacat caaaaggata 480  
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gaattgaatg ctgccaacac aacagtttcc caagaccgg aactgagtt gtacactatt 600  
agtagtgaac tggatttcaa tataacaagc aaccatagct ttgtgtgtct tgtcaagtat 660  
ggagacttaa cagtatcaca gatcttcaac tggcaaaaat gtaag 705

<210> 15  
<211> 705  
<212> DNA  
<213> Canis familiaris

<400> 15  
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agtgtccggg tcttgggaaa ctgtgtgtgt ggcagcattc aattcttctt cttttccca 180  
ccaggagagg tgaggctttg gaaaacctcc agagggtgaa cacattatcc ttttgatgtc 240  
atgggatgga tttccaaggt cagttatact agggacaggg aagtcagctc tgaccaataa 300  
catcaccgaa gtcattgtgt tcaactttgt agacctttt tcagtctttt gaacgataca 360  
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gaagtcagca aaggtgcgat tctcatactt ggaccacact ttcgtttgtc cagatgtgac 480  
agccagcacc acttcatcat ctttttgcca atagattcga actttcatca gttctgtagt 540  
ggaaatgttg taatcacagg acagtactgc tacttcttct actgtcttgt tcacctggat 600  
gatgcctgaa cagaagtaaa agagactagc tagcaccaag agctgagaga cttgagata 660

tgggtgtttg agtgggtggtg ttctccactt cgctgtgtaa tccat

705

<210> 16

<211> 1795

<212> DNA

<213> Canis familiaris

<220>

<221> CDS

<222> (7)..(846)

<400> 16

gccaaag atg tat ctc aga tgc act atg gaa ctg aat aac att ctc ttt 48

Met Tyr Leu Arg Cys Thr Met Glu Leu Asn Asn Ile Leu Phe

1

5

10

gtg atg acc ctc ctg ctc tat ggt gct gct tcc atg aag agt caa gca 96

Val Met Thr Leu Leu Leu Tyr Gly Ala Ala Ser Met Lys Ser Gln Ala

15

20

25

30

tat ttc aac aag act gga gaa ctg cca tgc cat ttt aca aat tct caa 144

Tyr Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln

35

40

45

aac ata agc ctg gat gag ttg gta gtg ttt tgg cag gac cag gat aag 192

Asn Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys

50

55

60

ctg gtt ctg tac gag cta tac aga ggc aaa gag aac cct caa aat gtt 240

Leu Val Leu Tyr Glu Leu Tyr Arg Gly Lys Glu Asn Pro Gln Asn Val

65

70

75

cat cgc aag tat aag ggc cgc aca agc ttt gac aaa gac aat tgg acc 288

His Arg Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr

80

85

90

ctg aga ctc cat aat att cag atc aag gac aag ggc ttg tat caa tgt 336

Leu Arg Leu His Asn Ile Gln Ile Lys Asp Lys Gly Leu Tyr Gln Cys

95

100

105

110

ttc gtt cat cat aaa ggg ccc aaa gga ctc gtt ccc atg cac cag atg 384

Phe Val His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met

115

120

125

aat tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata atg 432

Asn Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met

130 135 140  
 gta act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc 480  
 Val Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys  
 145 150 155  
 tca tcc ata caa ggt tac cca gaa ccc aag gag atg tat ttt ttg gta 528  
 Ser Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val  
 160 165 170  
 aaa acc gag aat tca agt act aag tat gat act gtc atg aag aaa tct 576  
 Lys Thr Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser  
 175 180 185 190  
 caa aat aat gtc aca gaa ctc tac aac gtt tct atc agc ttg tcc ttc 624  
 Gln Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe  
 195 200 205  
 tca gtc cct gaa gca agc aat gtg agc atc ttc tgt gtc ctg caa ctt 672  
 Ser Val Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu  
 210 215 220  
 gag tca atg aag ctt ccc tcc cta cct tat aat ata gaa acc aac aaa 720  
 Glu Ser Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Glu Thr Asn Lys  
 225 230 235  
 gtg gag aga aaa gaa agt gag cag acc aag gaa aga gta cgg tac cat 768  
 Val Glu Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His  
 240 245 250  
 gaa acg gaa aga tct gat gaa gcc cag tgt gtt aac att tcg aag aca 816  
 Glu Thr Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr  
 255 260 265 270  
 gct tca ggc gac aac agt act aca cag ttt taattaaaga gtaaagtcca 866  
 Ala Ser Gly Asp Asn Ser Thr Thr Gln Phe  
 275 280  
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 ttattattgc cactaataat aagaggcttt ccagggtccc ctctaaatga gagagcctcc 986  
 ctataatgcc agttctgctc cctacaccag gagcagattt taactgcttc ttttcatctc 1046  
 agagcacact tgtgggcat gctcacctga ctggctctg gctcaggaat aatgtttaag 1106  
 actaacacct cctgtttcag attcagcctt cttttcttaa ttttatacat tgtgttttat 1166

gtagaactcc caattactgg actaatggct tttatctatg ctttaattcta agatagtgcc 1226  
 tcattccatc ttgtatatatt gtgactacct ctgcagctctg ggtgggagtt ttgtatgtta 1286  
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 aattactatg ccctgagaaa attctaccca ctgctgagga gctcttgctc ctctgtgagg 1406  
 gtcagtacga aaatggtggc ttggtgtgct gacaacaatg agcagaccaa ctcaaaattt 1466  
 ggaagattag gaatgatgga gatagaacca gctctgagtc ctggagccac ttctatctgg 1526  
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 aaatggctga gatgatggct cagggcaact gttcaagagc caactgagag atcacaatac 1706  
 ttaaaagaga aaaaagaaaa aagaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1766  
 aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1795

&lt;210&gt; 17

&lt;211&gt; 280

&lt;212&gt; PRT

&lt;213&gt; Canis familiaris

&lt;400&gt; 17

Met Tyr Leu Arg Cys Thr Met Glu Leu Asn Asn Ile Leu Phe Val Met  
 1 5 10 15

Thr Leu Leu Leu Tyr Gly Ala Ala Ser Met Lys Ser Gln Ala Tyr Phe  
 20 25 30

Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn Ile  
 35 40 45

Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu Val  
 50 55 60

Leu Tyr Glu Leu Tyr Arg Gly Lys Glu Asn Pro Gln Asn Val His Arg  
 65 70 75 80

Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu Arg  
 85 90 95

Leu His Asn Ile Gln Ile Lys Asp Lys Gly Leu Tyr Gln Cys Phe Val



100	105	110
His His Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Asn Ser		
115	120	125
Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Met Val Thr		
130	135	140
Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser Ser		
145	150	155
Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Leu Val Lys Thr		
165	170	175
Glu Asn Ser Ser Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn		
180	185	190
Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Ser Phe Ser Val		
195	200	205
Pro Glu Ala Ser Asn Val Ser Ile Phe Cys Val Leu Gln Leu Glu Ser		
210	215	220
Met Lys Leu Pro Ser Leu Pro Tyr Asn Ile Glu Thr Asn Lys Val Glu		
225	230	235
Arg Lys Glu Ser Glu Gln Thr Lys Glu Arg Val Arg Tyr His Glu Thr		
245	250	255
Glu Arg Ser Asp Glu Ala Gln Cys Val Asn Ile Ser Lys Thr Ala Ser		
260	265	270
Gly Asp Asn Ser Thr Thr Gln Phe		
275	280	

&lt;210&gt; 18

&lt;211&gt; 1795

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;400&gt; 18

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 caaaatatta aagcaacact ataaagccat aacatacaaa actcccaccc agactgcaga 540  
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 <211> 840  
 <212> DNA  
 <213> Canis familiaris

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 ctttttataa attctcaaaa cataagcctg gatgagttgg tagtgttttg gcaggaccag 180  
 gataagctgg ttctgtacga gctatacaga ggcaaagaga accctcaaaa tgttcacgc 240  
 aagtataagg gccgcacaag ctttgacaaa gacaattgga ccttgagact ccataatatt 300  
 cagatcaagg acaagggctt gtatcaatgt ttcgttcac ataaagggcc caaaggactc 360  
 gttcccatgc accagatgaa ttctgacctc tcagtgttg ctaacttcag tcaacctgaa 420  
 ataatggtaa cttctaataa aacagaaaaa tctggcatca taaatttgac ctgctcatcc 480  
 atacaagggt acccagaacc caaggagatg ttttttttgg taaaaaccga gaattcaagt 540  
 actaagtatg atactgtcat gaagaaatct caaaataatg tcacagaact ctacaacgtt 600  
 tctatcagct tgccttctc agtccctgaa gcaagcaatg tgagcatctt ctgtgtcctg 660  
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 agaaaagaaa gtgagcagac caaggaaaga gtacgggtacc atgaaacgga aagatctgat 780  
 gaagcccagt gtgttaacat ttcgaagaca gcttcaggcg acaacagtac tacacagttt 840

<210> 20  
 <211> 840  
 <212> DNA  
 <213> Canis familiaris

<400> 20

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 ggatgagcag gtcaaattta tgatgccaga atttctgtt ctattagaag ttaccattat 420  
 ttcaggttga ctgaagttag caagcactga taggtcagaa ttcattctgt gcatgggaac 480  
 gagtcctttg ggccctttat gatgaacgaa acattgatac aagcccttgt ccttgatctg 540  
 aatattatgg agtctcaggg tccaattgtc tttgtcaaag cttgtgcggc cttataactt 600  
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 ctggctctgc caaaacacta ccaactcatc caggcttatg ttttgagaat ttgtaaaatg 720  
 gcatggcagt tctccagtct tgttgaaata tgcttgactc ttcattggaag cagcaccata 780  
 gagcaggagg gtcattcaca agagaatgtt attcagttcc atagtgcac tgagatacat 840

<210> 21

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 21

gtcaragctg acttcctt

18

<210> 22

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 22

gtagaaactc ctcagaacaa tg

22

<210> 23

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 23

gtagtattttt ggcaggacc

19

<210> 24

<211> 23

<212> DNA

<213> Canis familiaris

<400> 24

tagaygsgca ggtcaaattt atg

23

<210> 25

<211> 2830

<212> DNA

<213> Felis catus

<220>

<221> CDS

<222> (179)..(1174)

<400> 25

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gttaggaagt tatggggagc tcacaaaggc tctcatcgt ttattcttaa caccttggtt 120

ctgtgttcct cggaatgtc actgagctta tacatctggt ctctgggagc tgcagtgg 178

atg ggc att tgt gac agc act atg gga ctg agt cac act ctc ctt gtg 226

Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu Val

1

5

10

15

atg gcc ctc ctg ctc tct ggt gtt tct tcc atg aag agt caa gca tat 274  
 Met Ala Leu Leu Leu Ser Gly Val Ser Ser Met Lys Ser Gln Ala Tyr  
 20 25 30

ttc aac aag act gga gaa ctg cca tgc cat ttt aca aac tct caa aac 322  
 Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn  
 35 40 45

ata agc ctg gat gag ctg gta gta ttt tgg cag gac cag gat aag ctg 370  
 Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu  
 50 55 60

gtt ctg tat gag ata ttc aga ggc aaa gag aac cct caa aat gtt cat 418  
 Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His  
 65 70 75 80

ctc aaa tat aag ggc cgt aca agc ttt gac aag gac aac tgg acc ctg 466  
 Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu  
 85 90 95

aga ctc cac aat gtt cag atc aag gac aag ggc aca tat cac tgt ttc 514  
 Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe  
 100 105 110

att cat tat aaa ggg ccc aaa gga cta gtt ccc atg cac caa atg agt 562  
 Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser  
 115 120 125

tct gac cta tca gtg ctt gct aac ttc agt caa cct gaa ata aca gta 610  
 Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val  
 130 135 140

act tct aat aga aca gaa aat tct ggc atc ata aat ttg acc tgc tca 658  
 Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser  
 145 150 155 160

tct ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta aac 706  
 Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn  
 165 170 175

act gag aat tca act act aag tat gat act gtc atg aag aaa tct caa 754  
 Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln  
 180 185 190

aat aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt tca 802  
 Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser  
 195 200 205

gtc cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg gag 850  
 Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu  
 210 215 220

aca ctg gag atg ctg ctc tcc cta cct ttc aat ata gat gca caa cct 898  
 Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro  
 225 230 235 240

aag gat aaa gac cct gaa caa ggc cac ttc ctc tgg att gcg gct gta 946  
 Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val  
 245 250 255

ctt gta atg ttt gtt gtt ttt tgt ggg atg gtg tcc ttt aaa aca cta 994  
 Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu  
 260 265 270

agg aaa agg aag aag aag cag cct ggc ccc tct cat gaa tgt gaa acc 1042  
 Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr  
 275 280 285

atc aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta cca 1090  
 Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro  
 290 295 300

tac cac gta cct gag aga tct gat gaa gcc cag tgt att aac att ttg 1138  
 Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu  
 305 310 315 320

aag aca gcc tca ggc gac aaa agt act aca cat ttt taattaaaga 1184  
 Lys Thr Ala Ser Gly Asp Lys Ser Thr Thr His Phe  
 325 330

ataaagtcca tataactgtc cattgtttat atgcctttcc cttcaagttt tgggcttacc 1244  
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 ccatttgtgt gttcttcctt gcatttgctt cattaggcca taagcatctt gttggtttct 2744  
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 aaaaaaaaaa aaaaaaaaaa aaaaaa 2830

&lt;210&gt; 26

&lt;211&gt; 332

&lt;212&gt; PRT

&lt;213&gt; Felis catus

&lt;400&gt; 26



Met Gly Ile Cys Asp Ser Thr Met Gly Leu Ser His Thr Leu Leu Val  
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 Phe Asn Lys Thr Gly Glu Leu Pro Cys His Phe Thr Asn Ser Gln Asn  
 35 40 45  
 Ile Ser Leu Asp Glu Leu Val Val Phe Trp Gln Asp Gln Asp Lys Leu  
 50 55 60  
 Val Leu Tyr Glu Ile Phe Arg Gly Lys Glu Asn Pro Gln Asn Val His  
 65 70 75 80  
 Leu Lys Tyr Lys Gly Arg Thr Ser Phe Asp Lys Asp Asn Trp Thr Leu  
 85 90 95  
 Arg Leu His Asn Val Gln Ile Lys Asp Lys Gly Thr Tyr His Cys Phe  
 100 105 110  
 Ile His Tyr Lys Gly Pro Lys Gly Leu Val Pro Met His Gln Met Ser  
 115 120 125  
 Ser Asp Leu Ser Val Leu Ala Asn Phe Ser Gln Pro Glu Ile Thr Val  
 130 135 140  
 Thr Ser Asn Arg Thr Glu Asn Ser Gly Ile Ile Asn Leu Thr Cys Ser  
 145 150 155 160  
 Ser Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn  
 165 170 175  
 Thr Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln  
 180 185 190  
 Asn Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser  
 195 200 205  
 Val Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu  
 210 215 220  
 Thr Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro  
 225 230 235 240  
 Lys Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val  
 245 250 255

Leu Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu  
260 265 270

Arg Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr  
275 280 285

Ile Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro  
290 295 300

Tyr His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu  
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Lys Thr Ala Ser Gly Asp Lys Ser Thr Thr His Phe  
325 330

<210> 27

<211> 2830

<212> DNA

<213> Felis catus

<400> 27

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aaaaaaaaac 2830

&lt;210&gt; 28

&lt;211&gt; 996

&lt;212&gt; DNA

&lt;213&gt; Felis catus

&lt;400&gt; 28

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ctctctggtg tttcttccat gaagagtcaa gcatatttca acaagactgg agaactgcc 120  
tgccatttta caaactctca aaacataagc ctggatgagc tggtagtatt ttggcaggac 180  
caggataagc tggttctgta tgagatattc agaggcaaag agaaccctca aaatgttcat 240  
ctcaaatata agggccgtac aagctttgac aaggacaact ggaccctgag actccacaat 300  
gttcagatca aggacaaggg cacatatcac tgtttcattc attataaagg gcccaaagga 360  
ctagttccca tgcaccaaact gagttctgac ctatcagtcg ttgctaactt cagtcaacct 420  
gaaataacag taacttctaa tagaacagaa aattctggca tcataaaatt gacctgctca 480  
tctatacaag gttaccaga acctaaggag atgtattttc agctaaacac tgagaattca 540  
actactaagt atgatactgt catgaagaaa tctcaaaata atgtgacaga actgtacaac 600

gtttctatca gcttgccttt ttcagtcctt gaagcacaca atgtgagcgt cttttgtgcc 660  
 ctgaaactgg agacactgga gatgctgctc tccctacctt tcaatataga tgcacaacct 720  
 aaggataaag accctgaaca aggccacttc ctctggattg cggctgtact tgtaatgttt 780  
 gttgtttttt gtgggatggg gtcctttaaa acactaagga aaaggaagaa gaagcagcct 840  
 ggcccctctc atgaatgtga aaccatcaaa agggagagaa aagagagcaa acagaccaac 900  
 gaaagagtac cataccacgt acctgagaga tctgatgaag ccagtgatat taacattttg 960  
 aagacagcct caggcgacaa aagtactaca cttttt 996

<210> 29  
 <211> 996  
 <212> DNA  
 <213> Felis catus

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 ctcccctttg atggtttcac attcatgaga ggggccaggc tgcttcttct tctttttcct 180  
 tagtgtttta aaggacacca tcccacaaaa aacaacaaac attacaagta cagccgcaat 240  
 ccagaggaag tggccttggt cagggtcttt atccttaggt tgtgcatcta tattgaaagg 300  
 tagggagagc agcatctcca gtgtctccag tttcagggca caaaagacgc tcacattgtg 360  
 tgcttcaggg actgaaaaag gcaagctgat agaaacgttg tacagttctg tcacattatt 420  
 ttgagatttc ttcattgacag tatcatactt agtagttgaa ttctcagtgt ttagctgaaa 480  
 atacatctcc ttaggttctg ggtaaccttg tatagatgag cagggtcaaatt ttatgatgcc 540  
 agaattttct gttctattag aagttactgt tatttcaggt tgactgaagt tagcaagcac 600  
 tgataggtca gaactcattt ggtgcatggg aactagtcct ttgggccctt tataatgaat 660  
 gaaacagtga tatgtgccct tgctcttgat ctgaacattg tggagtctca ggtccagtt 720  
 gtccttgatc aagcttgatc ggcccttata tttgagatga acattttgag ggttctcttt 780

gcctctgaat atctcataca gaaccagctt atcctgggtcc tgccaaaata ctaccagctc 840  
 atccaggctt atgttttgag agtttgtaaa atggcatggc agttctccag tcttggtgaa 900  
 atatgcttga ctcttcatgg aagaaacacc agagagcagg agggccatca caaggagagt 960  
 gtgactcagt cccatagtgc tgtcacaaat gcccat 996

<210> 30

<211> 509

<212> DNA

<213> Felis catus

<220>

<221> CDS

<222> (1)..(507)

<400> 30

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Ile	Gln	Gly	Tyr	Pro	Glu	Pro	Lys	Glu	Met	Tyr	Phe	Gln	Leu	Asn	Thr	
1				5				10						15		
gag	aat	tca	act	act	aag	tat	gat	act	gtc	atg	aag	aaa	tct	caa	aat	96
Glu	Asn	Ser	Thr	Thr	Lys	Tyr	Asp	Thr	Val	Met	Lys	Lys	Ser	Gln	Asn	
			20					25						30		
aat	gtg	aca	gaa	ctg	tac	aac	gtt	tct	atc	agc	ttg	cct	ttt	tca	gtc	144
Asn	Val	Thr	Glu	Leu	Tyr	Asn	Val	Ser	Ile	Ser	Leu	Pro	Phe	Ser	Val	
			35					40						45		
cct	gaa	gca	cac	aat	gtg	agc	gtc	ttt	tgt	gcc	ctg	aaa	ctg	gag	aca	192
Pro	Glu	Ala	His	Asn	Val	Ser	Val	Phe	Cys	Ala	Leu	Lys	Leu	Glu	Thr	
			50				55							60		
ctg	gag	atg	ctg	ctc	tcc	cta	cct	ttc	aat	ata	gat	gca	caa	cct	aag	240
Leu	Glu	Met	Leu	Leu	Ser	Leu	Pro	Phe	Asn	Ile	Asp	Ala	Gln	Pro	Lys	
			65				70							75		80
gat	aaa	gac	cct	gaa	caa	ggc	cac	ttc	ctc	tgg	att	gcg	gct	gta	ctt	288
Asp	Lys	Asp	Pro	Glu	Gln	Gly	His	Phe	Leu	Trp	Ile	Ala	Ala	Val	Leu	
					85					90					95	
gta	atg	ttt	gtt	gtt	ttt	tgt	ggg	atg	gtg	tcc	ttt	aaa	aca	cta	agg	336
Val	Met	Phe	Val	Val	Phe	Cys	Gly	Met	Val	Ser	Phe	Lys	Thr	Leu	Arg	
					100					105				110		
aaa	agg	aag	aag	aag	cag	cct	ggc	ccc	tct	cat	gaa	tgt	gaa	acc	atc	384

Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Ile  
 115 120 125  
 aaa agg gag aga aaa gag agc aaa cag acc aac gaa aga gta cca tac 432  
 Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr  
 130 135 140  
 cac gta cct gag aga tct gat gaa gcc cag tgt att aac att ttg aag 480  
 His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys  
 145 150 155 160  
 aca gcc tca ggc gac aaa agt act aca ca 509  
 Thr Ala Ser Gly Asp Lys Ser Thr Thr  
 165  
 <210> 31  
 <211> 169  
 <212> PRT  
 <213> Felis catus  
 <400> 31  
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn Thr  
 1 5 10 15  
 Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn  
 20 25 30  
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val  
 35 40 45  
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr  
 50 55 60  
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Asp Ala Gln Pro Lys  
 65 70 75 80  
 Asp Lys Asp Pro Glu Gln Gly His Phe Leu Trp Ile Ala Ala Val Leu  
 85 90 95  
 Val Met Phe Val Val Phe Cys Gly Met Val Ser Phe Lys Thr Leu Arg  
 100 105 110  
 Lys Arg Lys Lys Lys Gln Pro Gly Pro Ser His Glu Cys Glu Thr Ile  
 115 120 125  
 Lys Arg Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr  
 130 135 140

His Val Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys  
 145 150 155 160

Thr Ala Ser Gly Asp Lys Ser Thr Thr  
 165

<210> 32  
 <211> 509  
 <212> DNA  
 <213> Felis catus

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 gatctctcag gtaagtggta tgggtactctt tcgttggctc gtttgccttc tttctctccc 120  
 cttttgatgg tttcacattc atgagagggg ccaggctgct tcttcttcc tttccttagt 180  
 gttttaaagg acaccatccc acaaaaaaca acaaacatta caagtacagc cgcaatccag 240  
 aggaagtggc cttgttcagg gtctttatcc ttaggttgtg catctatatt gaaaggtagg 300  
 gagagcagca tctccagtgt ctccagtttc agggcacaaa agacgctcac attgtgtgct 360  
 tcagggactg aaaaaggcaa gctgatagaa acgttgtaca gttctgtcac attattttga 420  
 gatttcttca tgacagtatc atacttagta gttgaattct cagtgtttag ctgaaaatac 480  
 atctccttag gttctgggta acctgttat 509

<210> 33  
 <211> 359  
 <212> DNA  
 <213> Felis catus

<220>  
 <221> CDS  
 <222> (1)..(357)

<400> 33  
 ata caa ggt tac cca gaa cct aag gag atg tat ttt cag cta aac act 48  
 Ile Gln Gly Tyr Pro Glu Pro Lys Glu Met Tyr Phe Gln Leu Asn Thr  
 1 5 10 15  
 gag aat tca act act aag tat gat act gtc atg aag aaa tct caa aat 96



Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn  
                   20                  25                  30  
  
 aat gtg aca gaa ctg tac aac gtt tct atc agc ttg cct ttt tca gtc 144  
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val  
                   35                  40                  45  
  
 cct gaa gca cac aat gtg agc gtc ttt tgt gcc ctg aaa ctg gag aca 192  
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr  
                   50                  55                  60  
  
 ctg gag atg ctg ctc tcc cta cct ttc aat ata gaa acc atc aaa agg 240  
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Glu Thr Ile Lys Arg  
                   65                  70                  75                  80  
  
 gag aga aaa gag agc aaa cag acc aac gaa aga gta cca tac cac gta 288  
 Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr His Val  
                                   85                  90                  95  
  
 cct gag aga tct gat gaa gcc cag tgt att aac att ttg aag aca gcc 336  
 Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys Thr Ala  
                   100                  105                  110  
  
 tca ggc gac aaa agt act aca ca 359  
 Ser Gly Asp Lys Ser Thr Thr  
                   115

<210> 34  
 <211> 119  
 <212> PRT  
 <213> Felis catus

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 Glu Asn Ser Thr Thr Lys Tyr Asp Thr Val Met Lys Lys Ser Gln Asn  
                   20                  25                  30  
  
 Asn Val Thr Glu Leu Tyr Asn Val Ser Ile Ser Leu Pro Phe Ser Val  
                   35                  40                  45  
  
 Pro Glu Ala His Asn Val Ser Val Phe Cys Ala Leu Lys Leu Glu Thr  
                   50                  55                  60  
  
 Leu Glu Met Leu Leu Ser Leu Pro Phe Asn Ile Glu Thr Ile Lys Arg  
                   65                  70                  75                  80

Glu Arg Lys Glu Ser Lys Gln Thr Asn Glu Arg Val Pro Tyr His Val  
                             85                            90                            95

Pro Glu Arg Ser Asp Glu Ala Gln Cys Ile Asn Ile Leu Lys Thr Ala  
                             100                            105                            110

Ser Gly Asp Lys Ser Thr Thr  
                             115

<210> 35

<211> 359

<212> DNA

<213> Felis catus

<400> 35

tgtgtagtac ttttgtcgcc tgaggctgtc ttcaaatgt taatacactg ggcttcatca 60  
 gatctctcag gtacgtggta tggactctt tcgttgggtct gtttgctctc ttttctctcc 120  
 cttttgatgg tttctatatt gaaaggtagg gagagcagca tctccagtgt ctccagtttc 180  
 agggcacaaa agacgctcac atttgtgtgt tcagggactg aaaaaggcaa gctgatagaa 240  
 acgttgtaca gttctgtcac attattttga gatttcttca tgacagtatc atacttagta 300  
 gttgaattct cagtgttttag ctgaaaatac atctccttag gttctgggta acctgtat 359

<210> 36

<211> 594

<212> DNA

<213> Felis catus

<220>

<221> CDS

<222> (1)..(522)

<400> 36

atg ggt cac gca gca aag tgg aaa aca cca cta ctg aag cac cca tat 48  
 Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr  
           1                            5                            10                            15  
 ccc aag ctc ttt ccg ctc ttg atg cta gct agt ctt ttt tac ttc tgt 96  
 Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys  
                             20                            25                            30

tca ggt atc atc cag gtg aac aag aca gtg gaa gaa gta gca gta cta 144  
 Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu  
 35 40 45

tcc tgt gat tac aac att tcc acc aaa gaa ctg acg gaa att cga atc 192  
 Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile  
 50 55 60

tat tgg caa aag gat gat gaa atg gtg ttg gct gtc atg tct ggc aaa 240  
 Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys  
 65 70 75 80

gta caa gtg tgg ccc aag tac aag aac cgc aca ttc act gac gtc acc 288  
 Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr  
 85 90 95

gat aac cac tcc att gtg atc atg gct ctg cgc ctg tca gac aat ggc 336  
 Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly  
 100 105 110

aaa tac act tgt att att caa aag att gaa aaa ggg tct tac aaa gtg 384  
 Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val  
 115 120 125

aaa cac ctg act tcg gtg atg tta ttg gtc aga ggc gtc aca ccc agc 432  
 Lys His Leu Thr Ser Val Met Leu Leu Val Arg Gly Val Thr Pro Ser  
 130 135 140

aca gag ccc aat gcc cat gcg gag ctt gaa atc atg acc ctg aga tca 480  
 Thr Glu Pro Asn Ala His Ala Glu Leu Glu Ile Met Thr Leu Arg Ser  
 145 150 155 160

aga cct gag ctg aga tca aga gtc gga cgc tta atc gac tga 522  
 Arg Pro Glu Leu Arg Ser Arg Val Gly Arg Leu Ile Asp  
 165 170

gccacccagg catcccaatg atactttcta aataaactct taaaaaaaaa aaaaaaaaaa 582

aaaaaaaaaa aa 594

&lt;210&gt; 37

&lt;211&gt; 173

&lt;212&gt; PRT

&lt;213&gt; Felis catus

&lt;400&gt; 37

Met Gly His Ala Ala Lys Trp Lys Thr Pro Leu Leu Lys His Pro Tyr

1                      5                      10                      15  
 Pro Lys Leu Phe Pro Leu Leu Met Leu Ala Ser Leu Phe Tyr Phe Cys  
                     20                      25                      30  
 Ser Gly Ile Ile Gln Val Asn Lys Thr Val Glu Glu Val Ala Val Leu  
                     35                      40                      45  
 Ser Cys Asp Tyr Asn Ile Ser Thr Lys Glu Leu Thr Glu Ile Arg Ile  
                     50                      55                      60  
 Tyr Trp Gln Lys Asp Asp Glu Met Val Leu Ala Val Met Ser Gly Lys  
                     65                      70                      75                      80  
 Val Gln Val Trp Pro Lys Tyr Lys Asn Arg Thr Phe Thr Asp Val Thr  
                     85                      90                      95  
 Asp Asn His Ser Ile Val Ile Met Ala Leu Arg Leu Ser Asp Asn Gly  
                     100                      105                      110  
 Lys Tyr Thr Cys Ile Ile Gln Lys Ile Glu Lys Gly Ser Tyr Lys Val  
                     115                      120                      125  
 Lys His Leu Thr Ser Val Met Leu Leu Val Arg Gly Val Thr Pro Ser  
                     130                      135                      140  
 Thr Glu Pro Asn Ala His Ala Glu Leu Glu Ile Met Thr Leu Arg Ser  
                     145                      150                      155                      160  
 Arg Pro Glu Leu Arg Ser Arg Val Gly Arg Leu Ile Asp  
                     165                      170

&lt;210&gt; 38

&lt;211&gt; 594

&lt;212&gt; DNA

&lt;213&gt; Felis catus

&lt;400&gt; 38

tttttttttt tttttttttt tttttttttt taagagttta tttagaaagt atcattggga 60  
 tgcttgggtg gtcagtcga ttaagcgtcc gactcttgat ctgagctcag gtcttgatct 120  
 cagggtcatg atttcaagct ccgcatgggc attgggctct gtgctgggtg tgacgcctct 180  
 gaccaataac atcaccgaag tcagggtgtt cactttgtaa gacccttttt caatcttttg 240  
 aataatacaa gtgtatttgc cattgtctga caggcgcaga gccatgatca caatggagtg 300

gttatcgggtg acgtcagtga atgtgcgggtt cttgtacttg ggccacactt gtactttgcc 360  
 agacatgaca gccaacacca tttcatcatc cttttgccaa tagattcgaa tttccgtcag 420  
 ttctttgggtg gaaatgttgt aatcacagga tagtactgct acttcttcca ctgtcttggt 480  
 cacctggatg atacctgaac agaagtaaaa aagactagct agcatcaaga gcggaaagag 540  
 cttgggatat ggggtgcttca gtagtgggtg tttccacttt gctgcgtgac ccat 594

<210> 39  
 <211> 519  
 <212> DNA  
 <213> Felis catus

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 acagtggaag aagtagcagt actatcctgt gattacaaca tttccaccaa agaactgacg 180  
 gaaattcgaa tctattggca aaaggatgat gaaatgggtg tggctgtcat gtctggcaaa 240  
 gtacaagtgt ggcccaagta caagaaccgc acattcactg acgtcaccga taaccactcc 300  
 attgtgatca tggctctgcg cctgtcagac aatggcaa at acatttgtat tattcaaaag 360  
 attgaaaaag ggtcttacia agtgaaacac ctgacttcgg tgatgttatt ggtcagaggc 420  
 gtcacaccca gcacagagcc caatgccc at gcggagcttg aaatcatgac cctgagatca 480  
 agacctgagc tgagatcaag agtcggacgc ttaatcgac 519

<210> 40  
 <211> 519  
 <212> DNA  
 <213> Felis catus

<400> 40  
 gtcgattaag cgtccgactc ttgatctcag ctccaggtctt gatctcaggg tcatgatttc 60  
 aagctccgca tgggcattgg gctctgtgct ggggtgtgacg cctctgacca ataacatcac 120  
 cgaagtcagg tgtttcactt tgtaagaccc tttttcaatc ttttgaataa tacaagtgtg 180

tttgccattg tctgacaggc gcagagccat gatcacaatg gagtggttat cggtgacgtc 240  
 agtgaatgtg cggttcttgt acttgggcca cacttgact ttgccagaca tgacagccaa 300  
 caccatttca tcaccccttt gccaatagat tcgaatttcc gtcagttctt tgggtggaaat 360  
 gttgtaatca caggatagta ctgctacttc ttccactgtc ttgttcacct ggatgatacc 420  
 tgaacagaag taaaaaagac tagctagcat caagagcgga aagagcttgg gatatgggtg 480  
 cttcagtagt ggtgttttcc actttgtctgc gtgacccat 519

&lt;210&gt; 41

&lt;211&gt; 1856

&lt;212&gt; DNA

&lt;213&gt; Canis familiaris

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (60)..(731)

&lt;400&gt; 41

caggatcctg aaaggtttca ctctgcttcc tgaagacctg aacactgctc cataaagcc 59

atg gct ggc ttt gga ttc cgg agg cat ggg gct cag ccg gac ctg gct 107  
 Met Ala Gly Phe Gly Phe Arg Arg His Gly Ala Gln Pro Asp Leu Ala  
 1 5 10 15

tct agg acc tgg ccc tgc act gct ctg ttt tct ctt ctc ttt atc ccc 155  
 Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro  
 20 25 30

gtc ttc tcc aaa ggg atg cat gtg gct cag cct gca gtg gtt ctg gcc 203  
 Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala  
 35 40 45

agc agc cgg ggt gtt gct agc ttc gtg tgt gaa tat ggg tct tca ggc 251  
 Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly  
 50 55 60

aac gca gcc gag gtc cgg gtg aca gtg ctg cgg cag gct ggc agc cag 299  
 Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Ala Gly Ser Gln  
 65 70 75 80

atg act gaa gtc tgt gcc gcg aca tac aca gtg gag gat gag ttg gcc 347  
 Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asp Glu Leu Ala

85	90	95	
ttc ctg gat gat tct acc tgc acc ggc acc tcc agt gga aac aaa gtg			395
Phe Leu Asp Asp Ser Thr Cys Thr Gly Thr Ser Ser Gly Asn Lys Val			
100	105	110	
aac ctc acc atc caa ggg ttg agg gcc atg gac acg ggg ctc tac atc			443
Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile			
115	120	125	
tgc aag gtg gag ctc atg tac cca cca ccc tac tat gta ggc atg gga			491
Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Val Gly Met Gly			
130	135	140	
aat gga acc cag att tat gtc atc gat cct gaa cct tgc cca gat tct			539
Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser			
145	150	155	160
gac ttc ctc ctc tgg atc ctt gca gca gtc agt tgc ggc ttg ttt ttt			587
Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe			
165	170	175	
tat agc ttt ctt atc aca gct gtt tct ttg agc aaa atg cta aag aaa			635
Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys			
180	185	190	
aga agc cct ctt acc aca ggg gtc tat gtg aaa atg ccc cca act gag			683
Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu			
195	200	205	
cca gaa tgt gaa aag caa ttt cag cct tat ttt att ccc atc aat tga			731
Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn			
210	215	220	
gagatcatta tgaagaagaa agaatatattt ccaatttcca ggagctgagg caattctaac 791			
tttgtgctat ccagctatgt gtacttgttt gtatatatttg ggggggggttt catctctctt 851			
taatataaag ctggatgcag aaccctaatg aagtgtacta caaattcaaa gcaaagggtgc 911			
aagaaaacag agccaggatg tttctgtcac atcagatcca attttcgtaa aagtatcact 971			
tgggagcaat atggggatgc agcattagga catgcgctct aggatatagg ttagggagtg 1031			
gtgcgggtcca aagaaagcaa aggagagaga gtcagggaga ggatgatatt gtacacactt 1091			
tgtattttaca tgtgagaagt ttatagctga agtgacgttt tcaagttaaa tttttgtgct 1151			

atgttatttt tcataaatgt aaaatcacgt gaagacttta aaaatattca catggctata 1211  
 ttttagccag tgattccaaa ggttgattg taccaatata tttttttta tctgatagta 1271  
 ttatgcatgg gggccacatg tgcttttggtg tttttgtga tggtttcaat ataaacacta 1331  
 tatggcagtg tcttcccacc aggggctcag ggggaagtttt atggagggat tcaggacact 1391  
 aatacgccag gtaaaataca aggtcacttg gtaactggct tggaaactgg atgaggtcat 1451  
 agttgattct tgtagacgtg ttgggctaaa ttggtgtga catgtgcttt gggcttttat 1511  
 gttagctcct ttcaaagatt tgtaaggag tcaaaactgg tatatctgat ttaactccat 1571  
 agaacaccat cgtcaagtaa acggctcatt ccaggagtct tggaggtatg aacttcaagg 1631  
 aagctctagt ttcacaaggg cccaattcc ttgctcatgg ttaatgccat gggcagaaaa 1691  
 cagcagcagg tggcagaaca ggtgatgaa gggttccgaa aacaaacact gttggtgttt 1751  
 ttttaactca ctattttctg tgaaaatgca acaacatgta taatattttt aattaaataa 1811  
 aaatctgtgg tggtcattaa aaaaaaaaaa aaaaaaaaaa aaaaa 1856

&lt;210&gt; 42

&lt;211&gt; 223

&lt;212&gt; PRT

&lt;213&gt; Canis familiaris

&lt;400&gt; 42

Met Ala Gly Phe Gly Phe Arg Arg His Gly Ala Gln Pro Asp Leu Ala  
 1 5 10 15

Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro  
 20 25 30

Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala  
 35 40 45

Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly  
 50 55 60

Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Ala Gly Ser Gln  
 65 70 75 80

Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asp Glu Leu Ala  
 85 90 95



Phe Leu Asp Asp Ser Thr Cys Thr Gly Thr Ser Ser Gly Asn Lys Val  
 100 105 110

Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile  
 115 120 125

Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Val Gly Met Gly  
 130 135 140

Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser  
 145 150 155 160

Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe  
 165 170 175

Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys  
 180 185 190

Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu  
 195 200 205

Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn  
 210 215 220

<210> 43

<211> 1856

<212> DNA

<213> Canis familiaris

<400> 43

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 tattatacat gttgttgcat tttcacagaa aatagtgagt taaaaaaaca ccaacagtgt 120  
 ttgttttcgg aaaccttcat caccctgttc tgccacctgc tgctgttttc tgcccatggc 180  
 attaaccatg agcaaggaat tggggccctt gtgaaactag agcttccttg aagttcatatc 240  
 ctccaagact cctggaatga gccgtttact tgacgatggt gttctatgga gttaaatcag 300  
 atataccagt tttgactccc ttacaaatct ttgaaaggag ctaacataaa agcccaaagc 360  
 acatgtcaac accaatttag cccaacacgt ctacaagaat caactatgac ctcatccagt 420  
 ttccaagcca gttaccaagt gacctgttat tttaacctggc gtattagtgt cctgaatccc 480

tccataaaac ttcccctgag cccctggtgg gaagacactg ccatatagtg tttatattga 540  
 aaccatcaac aaatacacaa aagcacatgt ggcccccatg cataatacta tcagataaaa 600  
 aaatatatat tgggtacaata caacctttgg aatcactggc taaaatatag ccatgtgaat 660  
 atttttaaag tcttcacgtg attttacatt tatgaaaaat aacatagcac aaaaatttaa 720  
 cttgaaaacg tcacttcagc tataaacttc tcacatgtaa atacaaagtg tgtacaatat 780  
 catcctctcc ctgactctct ctcccttgct ttctttggac cgcaccactc cctaacctat 840  
 atcctagagc gcatgtccta atgctgcac cccatattgc tcccaagtga tacttttacg 900  
 aaaattggat ctgatgtgac agaaacatcc tggctctgtt ttcttgacc tttgctttga 960  
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 atgcatccct ttggagaaga cggggataaa gagaagagaa aacagagcag tgcagggcc 1740  
 ggtcctagaa gccaggtccg gctgagcccc atgcctccgg aatccaaagc cagccatggc 1800  
 tttatggagc agtggttcagg tcttcaggaa gcagagtga acctttcagg atcctg 1856

&lt;210&gt; 44

<211> 669  
<212> DNA  
<213> Canis familiaris

<400> 44  
atggctggct ttggattccg gaggcattgg gctcagccgg acctggcttc taggacctgg 60  
ccctgcactg ctctgttttc tcttctcttt atccccgtct tctccaaagg gatgcatgtg 120  
gctcagcctg cagtgggtct ggccagcagc cgggggtgtg ctagcttcgt gtgtgaatat 180  
gggtcttcag gcaacgcagc cgagggtccg gtgacagtgc tgcggcaggc tggcagccag 240  
atgactgaag tctgtgccgc gacatacaca gtggaggatg agttggcctt cctggatgat 300  
tctacctgca ccggcacctc cagtggaaac aaagtgaacc tcaccatcca agggttgagg 360  
gccatggaca cggggctcta catctgcaag gtggagctca tgtaccacc accctactat 420  
gtaggcattg gaaatggaac ccagatttat gtcacgac ctagaaccttg ccagattct 480  
gacttctcc tctggatcct tgcagcagtc agttcgggct tgttttttta tagctttctt 540  
atcacagctg tttctttgag caaatgcta aagaaaagaa gccctcttac cacaggggtc 600  
tatgtgaaaa tgccccaac tgagccagaa tgtgaaaagc aatttcagcc ttattttatt 660  
cccatcaat 669

<210> 45  
<211> 669  
<212> DNA  
<213> Canis familiaris

<400> 45  
attgatggga ataaaataag gctgaaattg cttttcacat tctggctcag ttgggggcat 60  
tttcacatag acccctgtgg taagagggtt tttttcttt agcattttgc tcaaagaaac 120  
agctgtgata agaaagctat aaaaaaaca gcccgaaactg actgctgcaa ggatccagag 180  
gaggaagtca gaatctgggc aaggttcagg atcgatgaca taaatctggg ttccatttcc 240  
catgcctaca tagtagggtg gtgggtacat gagctccacc ttgcagatgt agagccccgt 300  
gtccatggcc ctcaaccctt ggatggtgag gttcactttg tttccactgg aggtgccggt 360

gcaggtagaa tcatccagga aggccaaactc atcctccact gtgtatgtcg cggcacagac 420  
 ttcagtcata tggtgccag cctgccgcag cactgtcacc cggacctcgg ctgcgttgcc 480  
 tgaagaccca tattcacaca cgaagctage aacaccccggt ctgctggcca gaaccaactgc 540  
 aggttgagcc acatgcatcc ctttgagaaa gacggggata aagagaagag aaaacagagc 600  
 agtgcagggc caggtcctag aagccaggtc cggctgagcc ccatgcctcc ggaatccaaa 660  
 gccagccat 669

<210> 46  
 <211> 1883  
 <212> DNA  
 <213> Felis catus

<220>  
 <221> CDS  
 <222> (69)..(740)

<400> 46  
 caaagcttca ggatcctgaa aggtttcact ctgcttctg aagacctgaa cactgctccc 60  
 ataaagcc atg gct tgc ttt gga ttc cgg agg cat ggg gct cag ctg gac 110  
 Met Ala Cys Phe Gly Phe Arg Arg His Gly Ala Gln Leu Asp  
 1 5 10  
 ctg gct tct agg acc tgg ccc tgc act gct ctg ttt tct ctt ctc ttt 158  
 Leu Ala Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe  
 15 20 25 30  
 atc ccc gtc ttc tcc aaa ggg atg cat gtg gcc cag cct gca gtg gtg 206  
 Ile Pro Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val  
 35 40 45  
 ctg gcc agc agc cga ggt gtc gcc agc ttc gtg tgt gaa tat ggg tct 254  
 Leu Ala Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser  
 50 55 60  
 tca ggc aat gcc gcc gaa gtc cga gtg act gtg ctg agg cag act ggc 302  
 Ser Gly Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Thr Gly  
 65 70 75  
 agc cag atg act gaa gtc tgt gct gcg aca tac aca gtg gag aat gag 350  
 Ser Gln Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu  
 80 85 90

ttg gcc ttc cta gat gat tcc acc tgc act ggc atc tcc agc gga aac 398  
 Leu Ala Phe Leu Asp Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn  
 95 100 105 110

aaa gtg aac ctc acc atc caa ggg ttg agg gcc atg gac acg gga ctc 446  
 Lys Val Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu  
 115 120 125

tac atc tgc aag gtg gag ctc atg tac cca cca ccc tac tat gca ggc 494  
 Tyr Ile Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly  
 130 135 140

atg ggc aat gga acc cag att tat gtc atc gat cct gaa cct tgc cca 542  
 Met Gly Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro  
 145 150 155

gat tct gac ttc ctc ctc tgg atc ctc gca gca gtc agt tca gga ttg 590  
 Asp Ser Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu  
 160 165 170

ttt ttt tat agc ttc ctt atc aca gct gtt tct ttg agc aaa atg cta 638  
 Phe Phe Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu  
 175 180 185 190

aag aaa aga agc cct ctt act aca ggg gtc tat gtg aaa atg ccc cca 686  
 Lys Lys Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro  
 195 200 205

aca gag cca gaa tgt gaa aag caa ttt cag cct tat ttt att ccc atc 734  
 Thr Glu Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile  
 210 215 220

aat tga cacaccgtta tgaagaagga agaacactgt ccaatttcta agagctgagg 790  
 Asn

caattctaac tttttgctat ccagctatgt tgcttatttg tgtatttttg ggggggattc 850

atctctcttt aatataaagc tggatgcaaa atccagatga agtgactac aatttgaagc 910

aaaggtgcag gaaaacagag ccaggatgtt tctgtcacat cagatccaat tttagtaaaa 970

gcatcactcg ggagcaatat agggatgcag tcttacgttg taggtgaagg atatgggtta 1030

gggggtggtg ctgtccaaag aatacaaagg aagagagtta gggagaggat gatattgtac 1090

acactttgta ttacacatg agaagtttat agctgaagtg atgttttcaa gttaaagttt 1150

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 atagtattgt gcatggggac cacatgtgct tttgtgtatt tgctgatggg tttaatataa 1330  
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 gacactaata caccaggtag aacacaaagt cacttggtta ctggcttgga aactggctga 1450  
 ggtcataact gattcttata gacacgttga gctgaattgg tggtgacatg tgatttgggc 1510  
 ttttatgtta gtccttttca aagggttgca agggagtcca gactgggtga tctgatgtaa 1570  
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 tcaaggaagc tctagtttca caagggtccc aattcctaac acatgggttca tgccatggac 1690  
 agaaaaaagc agccggtggc agaacggggg gatgaaagtt tctaaaaact aacactgttg 1750  
 gtgtttttta actcattatt ttccatgaaa atgcaacaac atgtataata tttttaatta 1810  
 aataaaaaatc tgtggtgggc aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 1870  
 aaaaaaaaaa aaa 1883

<210> 47  
 <211> 223  
 <212> PRT  
 <213> Felis catus

<400> 47  
 Met Ala Cys Phe Gly Phe Arg Arg His Gly Ala Gln Leu Asp Leu Ala  
 1 5 10 15  
 Ser Arg Thr Trp Pro Cys Thr Ala Leu Phe Ser Leu Leu Phe Ile Pro  
 20 25 30  
 Val Phe Ser Lys Gly Met His Val Ala Gln Pro Ala Val Val Leu Ala  
 35 40 45  
 Ser Ser Arg Gly Val Ala Ser Phe Val Cys Glu Tyr Gly Ser Ser Gly  
 50 55 60  
 Asn Ala Ala Glu Val Arg Val Thr Val Leu Arg Gln Thr Gly Ser Gln  
 65 70 75 80

Met Thr Glu Val Cys Ala Ala Thr Tyr Thr Val Glu Asn Glu Leu Ala  
                     85                    90                    95

Phe Leu Asp Asp Ser Thr Cys Thr Gly Ile Ser Ser Gly Asn Lys Val  
                     100                    105                    110

Asn Leu Thr Ile Gln Gly Leu Arg Ala Met Asp Thr Gly Leu Tyr Ile  
                     115                    120                    125

Cys Lys Val Glu Leu Met Tyr Pro Pro Pro Tyr Tyr Ala Gly Met Gly  
                     130                    135                    140

Asn Gly Thr Gln Ile Tyr Val Ile Asp Pro Glu Pro Cys Pro Asp Ser  
                     145                    150                    155                    160

Asp Phe Leu Leu Trp Ile Leu Ala Ala Val Ser Ser Gly Leu Phe Phe  
                     165                    170                    175

Tyr Ser Phe Leu Ile Thr Ala Val Ser Leu Ser Lys Met Leu Lys Lys  
                     180                    185                    190

Arg Ser Pro Leu Thr Thr Gly Val Tyr Val Lys Met Pro Pro Thr Glu  
                     195                    200                    205

Pro Glu Cys Glu Lys Gln Phe Gln Pro Tyr Phe Ile Pro Ile Asn  
                     210                    215                    220

<210> 48  
 <211> 1883  
 <212> DNA  
 <213> Felis catus

<400> 48  
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 agttaaaaaa caccaacagt gttagttttt agaaactttc atcaccocgt tctgccaccg 180  
 gctgcttttt tctgtccatg gcatgaacca tgtgttagga attggggccc ttgtgaaact 240  
 agagcttcct tgaagttcgt acctacaaga cccctggagt gagccatttt cttgagggtg 300  
 gtgttctatt gaattacatc agatacacca gtctggactc cttgcaaac ctttgaaagg 360  
 agctaacata aaagcccaaa tcacatgtca acaccaattc agctcaacgt gtctataaga 420

atcagttatg acctcagcca gtttccaagc cagttaccaa gtgactttgt gttctacctg 480  
 gtgtattagt gtcctgagcc cctccataaa acttcccctg aacccatggt gggaagacac 540  
 tgccatatag tgtttatatt aaaaccatca gcaaatacac aaaagcacat gtggtcccca 600  
 tgcacaatac tatcaaataa aaaaaatac atattggtac aatacaacct ttggaatcac 660  
 tggctaaaat atagccacgt gagtatTTTT aaagtcttca tgtaattcca catttaagaa 720  
 aaataacagc acaaaaacttt aacttgaaaa catcacttca gctataaaact tctcatgtgt 780  
 aaatacaaag tgtgtacaat atcatcctct ccctaactct ctccctttgt attctttgga 840  
 cagcaccacc ccctaaccga tatccttcac ctacaacgta agactgcac cctatattgc 900  
 tcccagtgta tgcttttact aaaattggat ctgatgtgac agaaacatcc tggctctgtt 960  
 ttcttgacac tttgcttcaa attgtagtac acttcactct gattttgcat ccagctttat 1020  
 attaaagaga gatgaatccc cccccaaaat acacaaataa gcaacatagc tggatagcaa 1080  
 aaagttagaa ttgcctcagc tottagaaat tggacagtgt tcttccttct tcataacggt 1140  
 gtgtcaattg atgggaataa aataaggctg aaattgcttt tcacattctg gctctgttgg 1200  
 gggcattttc acatagaccc ctgtagtaag agggcttctt ttcttttagca ttttgctcaa 1260  
 agaaacagct gtgataagga agctataaaa aaacaatcct gaactgactg ctgcgaggat 1320  
 ccagaggagg aagtcagaat ctgggcaagg ttcaggatcg atgacataaa tctgggttcc 1380  
 attgcccagc cctgcatagt aggggtggtg gtacatgagc tccaccttgc agatgtagag 1440  
 tcccgtgtcc atggccctca acccttggat ggtgaggttc actttgtttc cgctggagat 1500  
 gccagtgcag gtggaatcat ctaggaaggc caactcattc tccactgtgt atgtcgcagc 1560  
 acagacttca gtcacttggc tgccagtctg cctcagcaca gtcactcgga ctccggcggc 1620  
 attgcctgaa gacctatatt cacacacgaa gctggcgaca cctcggtctg tggccagcac 1680  
 cactgcaggc tgggccacat gcatcccttt ggagaagacg gggataaaga gaagagaaaa 1740  
 cagagcagtg cagggccagg tctagaagc caggtccagc tgagcccat gcctccggaa 1800  
 tccaaagcaa gccatggctt tatgggagca gtgttcaggt cttcaggaa cagagtga 1860



cctttcagga tcttgaagct ttg

1883

<210> 49  
<211> 669  
<212> DNA  
<213> *Felis catus*

<400> 49

atggccttgct ttggattccg gaggcattgg gctcagctgg acctggcttc taggacctgg 60  
ccctgcactg ctctgttttc tcttctcttt atccccgtct tctccaaagg gatgcatgtg 120  
gccagcctg cagtgggtgct ggccagcagc cgaggtgtcg ccagcttcgt gtgtgaatat 180  
gggtcttcag gcaatgccgc cgaagtccga gtgactgtgc tgaggcagac tggcagccag 240  
atgactgaag tctgtgtctg gacatacaca gtggagaatg agttggcctt cctagatgat 300  
tccacctgca ctggcatctc cagcggaaac aaagtgaacc tcaccatcca agggttgagg 360  
gcatggaca cgggactcta catctgcaag gtggagctca tgtaccacc accctactat 420  
gcaggcatgg gcaatggaac ccagatttat gtcacgac ctgaaccttg ccagattct 480  
gacttcctcc tctggatcct cgcagcagtc agttcaggat tgttttttta tagcttcctt 540  
atcacagctg tttctttgag caaaatgcta aagaaaagaa gccctcttac tacaggggtc 600  
tatgtgaaaa tgccccaac agagccagaa tgtgaaaagc aatttcagcc ttattttatt 660  
cccatcaat 669

<210> 50  
<211> 669  
<212> DNA  
<213> *Felis catus*

<400> 50

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tttcacatag acccctgtag taagagggtc tcttttcttt agcattttgc tcaaagaaac 120  
agctgtgata aggaagctat aaaaaaaca tcttgaactg actgctgcga ggatccagag 180  
gaggaagtca gaatctgggc aaggttcagg atcgatgaca taaatctggg ttccattgcc 240

catgcctgca tagtaggggtg gtgggtacat gagctccacc ttgcagatgt agaqtcccg 300  
 gtccatggcc ctcaaccctt ggatgggtgag gttcactttg tttccgctgg agatgccagt 360  
 gcaggtggaa tcattctagga aggccaactc attctccact gtgtatgtcg cagcacagac 420  
 ttcagtcata tggctgccag tctgcctcag cacagtcact cggacttcgg cggcattgcc 480  
 tgaagacca tattcacaca cgaagctggc gacacctcgg ctgctggcca gcaccactgc 540  
 aggctggggc acatgcatcc ctttgagaa gacggggata aagagaagag aaaacagagc 600  
 agtgcagggc caggctctag aagccaggtc cagctgagcc ccatgcctcc ggaatccaaa 660  
 gcaagccat 669

<210> 51

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 51

atacaagggtt acccagaacc 20

<210> 52

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 52

tgtgtagtac ttttgtcgcc 20

<210> 53

<211> 34

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 53

gggaattcgc caccatgggt cacgcagcaa agtg

34

<210> 54

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 54

ccctcgagct atgtagacag gtgagatc

28

<210> 55

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 55

gtaatacgac tcactatagg gc

22

<210> 56

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 56

accactccat tgtgatcatg

20

<210> 57

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 57

gtcttgatct cagggtcatg

20

<210> 58

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 58

gcggatccac catgggcatt tgtgacagca c

31

<210> 59

<211> 33

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 59

gcctcgagtt aaaaatgtgt agtacttttg tcg

33

<210> 60

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 60

gtgaacctsa cyatccaagg

20

<210> 61

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 61

gcattttcac atagaccct g

21

<210> 62

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 62

ggtacgtagg gatgcatgtg gctcagc

27

<210> 63

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 63

ccgaattctc agtcagaatc tgggcaaggt tc

32

<210> 64

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 64

ggtacgtagg tgctgcttcc atgaagag

28

<210> 65

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Primer

<400> 65

cccctaggtt aaaactgtgt agtactgttg tcgcc

35